

SECTION 15712

INDUCED DRAFT COOLING TOWERS - STEEL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Induced draft cooling towers - steel

1.2 PERFORMANCE REQUIREMENTS

- A. Tower to operate at 7500 feet elevation.
- B. Tower assembly to comply with the requirements of UBC seismic zone 4 construction.
- C. Sound pressure levels, measured at grade level 50 feet from the cooling tower, shall not exceed the following:
 - 1. Hz/dB: 63/75, 125/72, 250/75, 500/71, 1000/60, 2000/60, 4000/49, 8000/40
 - 2. Weighted average: 73dBA

1.3 SUBMITTALS

- A. Submit the following in accordance with the requirements of Section 01300:
 - 1. Catalog data.
 - 2. Certifications that cooling tower performance, based on CTI 201, meet or exceed specified requirements.
 - 3. Installation instructions.
 - 4. Performance curves for site specific data, plotting entering water temperature and leaving water temperature against wet bulb temperature.
 - 5. Operations and maintenance data.
 - 6. Warranties.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the product specified in this section with minimum 5 years experience. The manufacturer must be a member of the Cooling Tower Institute.
- B. Materials: Flame spread/smoke developed rating of 25/50 or less in accordance with ASTM E84.

1.5 WARRANTY

- A. Warrant the entire tower, including the motor, against failure due to defects in materials and workmanship for a period of 5 years following shipment to the site.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Marley Cooling Tower Co., Model NC _____.

2.2. PERFORMANCE

A. Capacity

1. Btu/h: _____
2. Water Flow: _____ gpm
3. Entering Water Temperature: _____ degrees F
4. Leaving Water Temperature: _____ degrees F
5. Entering Design Air WB Temperature: _____ degrees F

2.3 PHYSICAL DATA

- A. Dry Weight: _____ pounds.
- B. Operating Weight: _____ pounds.
- C. Overall Dimensions: _____ long, _____ wide, _____ high.

2.4 MANUFACTURED UNIT

- A. Provide unit for outdoor use, factory assembled, single cell, cross flow, vertical discharge, induced draft type, with motor.
- B. Cooling Tower Construction: Heavy gauge galvanized steel structural components, cold water basin, basin covers, hot water basin, fan deck and fan cylinder. Components subject to factory welding shall be hot drip galvanized after completion of fabrication.
- C. Motor: Mounted outside of air stream, two speed, 1800/900 rpm, totally enclosed fan cooled (TEFC). Refer to Section 15170.
1. _____ hp.
 2. _____ volts, 3 phase, 60 Hz.
- D. Fan: Multi blade, cast aluminum, adjustable pitch.
1. Fan Diameter: _____ inches.
 2. Air Flow: _____ cfm.
- E. Fan Drive: Right-angle, industrial duty, oil lubricated, geared speed reducer equipped with an oil level sightglass and drive shaft.
1. Speed reducers employing pulleys and belts are not acceptable.
- F. Fan Guard: One piece, welded steel rod and wire guard, hot dipped galvanized after fabrication.
- G. Fill, Louvers, Drift Eliminators: 15 mil (0.015 inch) thick PVC fill sheet. Drift not to exceed 0.005 percent of circulated design gpm.
1. Minimum wetted surface area: _____ square feet.

- H. Hot Water Distribution System: Provide basin covers and orifice type inert polypropylene nozzles that are easily removable and replaceable. Provide flow-control valves at the inlet to each basin to permit flow balancing and maintenance shut-off to selected cells.
 - 1. Inlet connections: Two ____ inch, with ____ inch globe valves.
- I. Cold Water Basin: Basin with water level controller, integral sump with openings for supply, return (with strainer), overflow, make-up water, and drain.
 - 1. [Bottom] [Bottom depressed] [Side] outlet connection: ____ inches.
- J. Accessories
 - 1. Electric Immersion Heaters: In cold water basin, suitable to maintain basin water temperature at 42 degrees F when outside temperature is minus 10 degrees F.
 - a. Basin heater ____ kW.
 - b. ____ volts, ____ phase, 60 Hz.
 - 2. Safety fan deck railings conforming to OSHA standards.
 - 3. Ladder from [grade] [roof] to fan deck conforming to OSHA standards.
 - 4. Vibration Limit Switch: To break power circuit to fan motor in a situation of excess vibration, factory wired, manual re-set and field adjustable for sensitivity.
 - a. Provide easy access to switch.
 - 5. Water Level Controller: Flygt Multitrode (MTR) level sensor, control relay (120 volts) and interconnecting cable shall be furnished and installed by the tower manufacturer. The relay shall provide a control voltage for a solenoid valve to fill the basin (high/low sensor) and contacts for a high level alarm. This unit replaces the float valve in the cold water basin.
 - 6. Variable Frequency Drive (VFD):

[Consult with project electrical engineer and refer to the electrical standards for VFD requirements.]

PART 3 EXECUTION

3.1 INSTALLATION

- A. Connect tower water supply and return piping to tower.
 - 1. Pitch tower water supply piping to tower.
 - 2. Pitch tower water return piping away from tower.
- B. Connect make-up piping with isolation valve connection to tower.
 - 1. Pitch piping to tower.
- C. Connect overflow and drain piping to tower and route to floor drain.
 - 1. Provide an isolation valve in drain line.

3.2 MANUFACTURER'S FIELD SERVICES

- A. Check, test, and start-up tower in presence of University operating personnel.
- B. Instruct the University's operating personnel in operating and routine maintenance procedure. Schedule a minimum of 4 hours training during normal working hours.

3.3 CONTRACTOR'S FIELD SERVICES

- A. Fill system with water.
- B. Check and fill gear drive with oil as recommended by the manufacturer.
- C. Rotate fan assembly and gear drive weekly from time of arrival to start-up.
- D. Verify operation of water temperature controls.

END OF SECTION